Quick Vision ELF

Bench-Top CNC Vision Measuring Systems

FEATURES

- **Controller-integrated compact size design**
  This series is appropriate for installation at a small site because of its light weight and space saving design.
- **Small body packed full of functions**
  This series offers various types of machines equipped with the PRL illuminator and power turret. Also, the laser auto-focus unit can be installed.
- The highest performance/cost ratio of the Quick Vision series

QV-ELF202PRO

SPECIFICATIONS

Model No. and Type		QVELF202 PRO machine
Range	X-axis	10" / 250mm
	Y-axis	8" / 200mm
	Z-axis	8" / 200mm
Resolution		0.1µm
High-sensitivity CCD camera		B&W
Accuracy* (20°C±0.2°C)	E_{1XY}	(2.0+3L/1000)µm
	E_{1Z}	(3.0+5L/1000)µm
Max. drive speed (X/Y/Z-axis)		200mm/s
Illumination (PRL: Programmable Ring Light)	Surface	LED, White
	Contour	LED, White
	Ring light	LED, White
Magnification change system**		Turret
Stage glass size		10.59 x 12.24" / 269 x 311mm
Max workpiece load		33lbs / 15kg
Optional accessory		laser auto-focus (factory installed option)

* The measuring accuracy is defined at the following conditions
Programmable power turret: 1X Objective set: 5X L = Dimension between two arbitrary points (mm)
**Fixed: Optical system with fixed magnification, Turret: Programmable Power Turret

Mitutoyo

QV Apex / Hyper QV

SERIES 363 — CNC Vision Measuring System

QV Apex302PRO

Hyper QV404PRO

QV Apex606PRO

Optional Accessories

02AKT250: 1X objective (HR type)
02ALA150: 1X objective (SL type)
02AKT300: 2.5X objective (HR type)
02ALA170: 2.5X objective (SL type)
02ALA420: 5X objective
02AKN020: Calibration glass chart

The optional laser auto-focus unit is optimal for high-speed height and depth measurements. (factory option)

SPECIFICATIONS

Model No.		QV Apex302PRO QV Apex302PRO2 QV Apex302PRO3 Hyper QV302PRO	QV Apex404PRO QV Apex404PRO2 QV Apex404PRO3 Hyper QV404PRO	QV Apex606PRO QV Apex606PRO2 QV Apex606PRO3 Hyper QV606PRO
Range	X-axis	12″ / 300mm	16″ / 400mm	24″ / 600mm
	Y-axis	8″ / 200mm	16″ / 400mm	26″ / 650mm
	Z-axis	8″ / 200mm	10″ / 250mm	10″ / 250mm
Resolution		0.1µm [0.02µm]		
High-sensitivity CCD camera		B&W (PRO3 model: color)		
Accuracy*	E_{1XY}	(1.5+3L/1000)µm [(0.8+2L/1000)µm]		
	E_{1Z}	(1.5+4L/1000)µm [(1.5+2L/1000)µm] [PRO2 model: (4.0+5L/1000)µm]		
	E_{2XY}	(2+4L/1000)µm [(1.4+3L/1000)µm] [PRO2 model: (2.5+4L/1000)µm]		
Illumination (PRL: Programmable Ring Light)	Surface	LED, RGB (PRO2 and PRO3 models: Halogen)		
	Contour	LED, white (PRO2 and PRO3 models: Halogen)		
	PRL	LED, RGB (PRO2 and PRO3 models: Halogen)		
Magnification change system		Programmable power turret (PRO2 model: Programmable power zoom lens)		
Max. drive speed	X/Y-axis	300mm/s [200mm/s]	400mm/s [200mm/s]	400mm/s [200mm/s]
	Z-axis	300mm/s [200mm/s]	300mm/s [200mm/s]	300mm/s [200mm/s]
Stage glass size		15.7x10.7″ / 399 x 271mm	19.4x21.7″ / 493 x 551mm	27.4x29.8″ / 697 x 758mm
Max workpiece height		7.8″ / 200mm	9.8″ / 250mm	9.8″ / 250mm
Max. stage loading		44lbs [33lbs] / 20kg [15kg]	88lbs [66lbs] / 40kg [30kg]	110lbs [88lbs] / 50kg [40kg]
Dimensions (W x D x H)**		33.8 x 37.4 x 63.3″ 859 x 951 x 1609mm	40.4 x 55.3 x 70″ 1027 x 1407 x 1778mm	51.5 x 78.1 x 70.6″ 1309 x 1985 x 1794mm
Mass**		794lbs / 360kg	1276lbs / 579kg	3196lbs / 1450kg

* The measuring accuracy is defined at the following conditions, Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)
In PRO2, the zoom magnification is 3X.
**Including machine stand

FEATURES

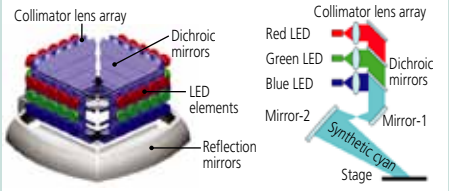
Non-stop Vision Measurement
Extreme Improvement in Throughput*
Conventional vision measuring systems endlessly repeat the cycle of stage displacement, stage stop, measurement, stage start and stage displacement again. This mode of operation is a fundamental limitation on improving measurement throughput.
In contrast, the Quick Vision Stream system uses an innovative image capture technique that avoids the need to repeatedly stop the stage so measurement can be continuous, but measuring accuracy is retained. Eliminating the time needed to accelerate, decelerate and then hold the stage motionless while a measurement is made achieves a extreme improvement in productivity.

Measurement Throughput Comparison between QV STREAM and the Conventional System
STREAM PLUS series: more than 5 times
* Comparison of measurement throughput using a Mitutoyo sample workpiece with that of Mitutoyo conventional systems

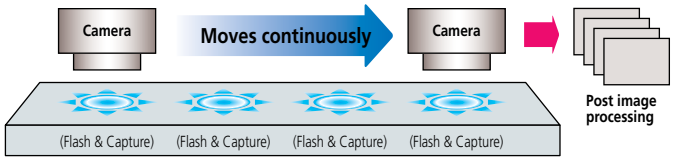
STREAM Mode
The measurement mode of a non-stop vision measuring system is referred to as the STREAM mode.

Newly Developed Stroboscopic Illumination System
The development of a high-intensity LED flash illuminator made non-stop vision measurement possible. At the precise moment the stage reaches a measurement point the illuminator creates an extremely short, high-intensity flash that effectively freezes all motion. The illuminator turns on and off so fast that no image blur occurs and the image is captured in full and accurate detail.
This innovative design takes full advantage of high-density, high-intensity LED arrays aided by collimating lenses and dichroic mirrors to produce ultra bright, directional and efficient illumination.

High-density mounting of ultra-high intensity LED elements



QV STREAM PLUS 606



Choice of based machine
In addition to the standard QV Apex is available as a based machine.

QV Apex 302

QV STREAM PLUS 404

SPECIFICATIONS

Model No.		QV STREAM PLUS 302	QV STREAM PLUS 404	QV STREAM PLUS 606
Range	X-axis	12" / 300mm	16" / 400mm	24" / 600mm
	Y-axis	8" / 200mm	16" / 400mm	26" / 650mm
	Z-axis	8" / 200mm	10" / 250mm	10" / 250mm
Resolution		0.1µm		
High-sensitivity CCD camera		B&W, progressive scan CCD		
Accuracy*	$E1_{XY}$	(1.5+3L/1000)µm		
	$E1_{Z}$	(1.5+4L/1000)µm		
	$E2_{XY}$	(2.0+4L/1000)µm		
Max. drive speed (X/Y/Z-axis)		300mm/s	XY: 400mm/s, Z:300mm/s	XY: 400mm/s, Z:300mm/s
Max. measuring speed		40mm/s	40mm/s	40mm/s
Illumination (PRL: Programmable Ring Light)	Surface	Hi-intensity LED [stroboscopic (B) and continuous (RGB & W) illumination, switchable]		
	Contour	Hi-intensity LED [stroboscopic (B) and continuous (B) illumination, switchable]		
	PRL	Hi-intensity LED [stroboscopic (B) and continuous (RGB & W) illumination, switchable]		
Magnification change system		Programmable power turret		
Stage glass size		15.7 x 10.7" / 399 x 271mm	19.4 x 21.7" / 493 x 551mm	27.4 x 29.8" / 697 x 758mm
Max. stage loading		44lbs / 20kg	88lbs / 40kg	110lbs / 50kg
Dimensions (W x D x H)**		33.8 x 37.4 x 63.3" 859 x 951 x 1609mm	40.4 x 55.3 x 70" 1027 x 1407 x 1778mm	51.5 x 78.15 x 70.62" 1309 x 1985 x 1794mm
Mass**		793lbs / 360kg	1276lbs / 579kg	3196lbs / 1450kg

* The measuring accuracy is defined at the following conditions
Programmable power turret: 1X Objective set: 2.5X
L = Dimension between two arbitrary points (mm)
** Including machine stand

Mitutoyo

QV HYBRID TYPE1, TYPE3

SERIES 365 — CNC Vision Measuring System

FEATURES

The Quick Vision Hybrid is a complex machine which allows vision measurement with both a CCD camera and high-speed scanning by applying a vision measurement unit in parallel with a non-contact displacement sensor.

QVH Apex404

SPECIFICATION: QV Apex-based

Model No.			QVH Apex302	QVH Apex404	QVH Apex606
Range	Vision		12″x8″x8″ 300 x 200 x 200mm	16″x16″x10″ 400 x 400 x 250mm	24″x26″x10″ 600 x 650 x 250mm
	Non-contact displacement sensor	Type1	7″x8″x8″ 180 x 200 x 200mm	11″x16″x10″ 280 x 400x 250mm	19″x26″x10″ 480 x 650 x 250mm
		Type3	7″x8″x8″ 176 x 200 x 200mm	11″x16″x10″ 276 x 400 x 250mm	19″x26″x10″ 476 x 650 x 250mm
Accuracy**	E_{1XY}		(1.5+3L/1000)µm		
	E_{1Z}		(1.5+4L/1000)µm / (1.5+4L/1000)µm*		
	E_{2XY}		(2.0+4L/1000)µm		

SPECIFICATION: QV STREAM PLUS-based

Model No.			QVH STREAM PLUS302	QVH STREAM PLUS404	QVH STREAM PLUS606
Range	Vision		12″x8″x8″ 300 x 200 x 200mm	16″x16″x10″ 400 x 400 x 250mm	24″x26″x10″ 600 x 650 x 250mm
	Non-contact displacement sensor	Type1	7″x8″x8″ 180 x 200 x 200mm	11″x16″x10″ 280 x 400x 250mm	19″x26″x10″ 480 x 650 x 250mm
		Type3	7″x8″x8″ 176 x 200 x 200mm	11″x16″x10″ 276 x 400 x 250mm	19″x26″x10″ 476 x 650 x 250mm
Accuracy**	E_{1XY}		(1.5+3L/1000)µm		
	E_{1Z}		(1.5+4L/1000)µm / (1.5+4L/1000)µm*		
	E_{2XY}		(2.0+4L/1000)µm		

SPECIFICATION: Hyper QV-based

Model No.			Hyper QVH302	Hyper QVH404	Hyper QVH606
Range	Vision		12″x8″x8″ 300 x 200 x 200mm	16″x16″x10″ 400 x 400 x 250mm	24″x26″x10″ 600 x 650 x 250mm
	Non contact displacement sensor	Type1	7″x8″x8″ 180 x 200 x 200mm	11″x16″x10″ 280 x 400x 250mm	19″x26″x10″ 480 x 650 x 250mm
		Type3	7″x8″x8″ 176 x 200 x 200mm	11″x16″x10″ 276 x 400 x 250mm	19″x26″x10″ 476 x 650 x 250mm
Accuracy**	E_{1XY}		(0.8+2L/1000)µm		
	E_{1Z}		(1.5+2L/1000)µm / (1.5+2L/1000)µm*		
	E_{2XY}		(1.4+3L/1000)µm		

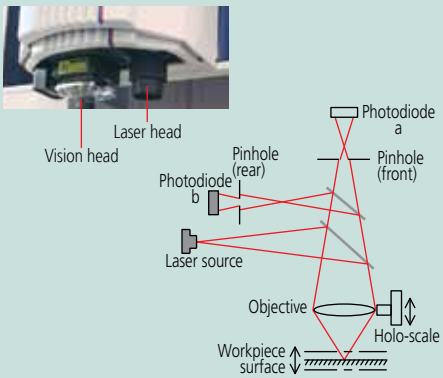
SPECIFICATION: QV ACCEL-based

Model No.			QVH ACCEL808	QVH ACCEL1010	QVH ACCEL1212	QVH ACCEL1517
Range	Vision		32″x32″x6″ 800 x 800 x 150mm	40″x40″x6″ 1000 x 1000 x 150mm	50″x50″x4″ 1250 x 1250 x 100mm	60″x70″x4″ 1500 x 1750 x 100mm
	Non contact displacement sensor	Type1	27″x32″x6″ 680 x 800 x 150mm	35″x40″x6″ 880 x 1000 x150mm	45″x50″x4″ 1130 x 1250 x 100mm	55″x70″x4″ 1380 x 1750 x 100mm
Accuracy**		E_{1XY}	(1.5+3L/1000)µm		(2.2+3L/1000)µm	
		E_{1Z}	(1.5+4L/1000)µm / (1.5+4L/1000)µm*		(2.5+5L/1000)µm / (2.5+5L/1000)µm*	
		E_{2XY}	(2.5+4L/1000)µm		(3.5+4L/1000)µm	

* Using Non-contact displacement sensor
**The measuring accuracy is defined at the following conditions
Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)

FEATURES: Hybrid Type1

- The focusing point method minimizes the difference in the measuring face reflectance and realizing high measurement reporducibility.
- The double pinhole method (less directivity) is employed as the measurement principle.



Laser Beam Safety Precautions

This system uses a low-power invisible laser beam (780nm) which corresponds to a CLASS 1 (invisible radiation) of IEC60825-1 for measurement. The CLASS 1 laser warning label as shown below is attached to the main unit.

CLASS 1 LASER PRODUCT

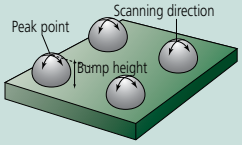
FEATURES: Hybrid Type3

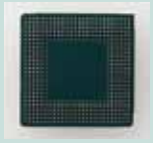
- Enables surface roughness or thickness measurement of thin and transparent objects such as film.
  Measurable thickness: 25 to 300µm
- Enables detection of high inclination angles both for mirrored surfaces and diffusing surfaces.
  Maximum tracking inclination angle ±87° (diffusing surface)
- Realizes high-resolution and high-accuracy height measurement by the wavelength confocal method using axial chromatic aberration.

*For Type3, due to the white halogen light, it is not applicable to JIS C 6802 "Radiation safety standard of laser products".

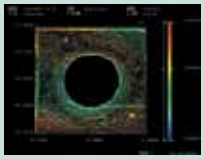
Applications

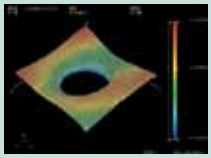
- Measurement of BGA/CSP bump height and coplanarity of IC packages



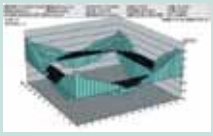


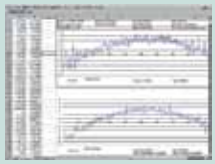
- Curved-form analysis (MSHAPE-QV)
  2D/3D contour lines display
  2D/3D unfiltered profile display
  Shadow graph display
  Curved plane analysis
  Unfiltered profile analysis, etc.





- Data processing (QV Graph)
  3D Bar chart display
  3D Surface chart display
  2D continuous cross-section graph display





Main Unit Startup System

This machine incorporates a startup system (relocation detection system), which disables operation when an unexpected vibration is applied or the machine is relocated. Be sure to contact your nearest Mitutoyo prior to relocating this machine after initial installation. Refer to page IX for details.

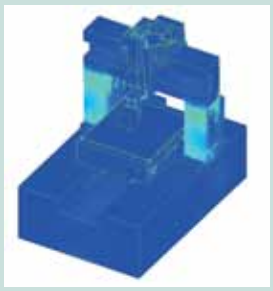
ULTRA QV

SERIES 363 — Ultra-high Accuracy CNC Vision Measuring System

Ultra-high accuracy crystallized glass scale with virtually zero thermal expansion

The Ultra Quick Vision is equipped with a crystallized glass scale having a resolution of 0.01µm and linear expansion coefficient of 0.08×10^{-6}/K. This virtually zero thermal expansion means the Ultra Quick Vision can minimize accuracy fluctuation resulting from thermal changes.

Ultra-precision manufacture eleven meters underground



By using FEM (Finite-Element Method) analysis of the base design, the placement of stiffening ribs and beams has been determined for the Ultra Quick Vision to provide optimal structural rigidity.

FEATURES

- Minimizes straightness errors through the use of a precision air-bearing linear guide system.
- Utilizes a 0.01µm resolution glass scale manufactured at an ultra-precision facility located eleven meters underground.
- Minimizes accuracy fluctuation against thermal change through the use of virtually zero thermal expansion glass scales.
- Optimizes the mechanical structure of the main unit in Finite Element Method analysis.
- Stabilizes the geometrical accuracy (i.e. straightness of each axis and perpendicularity) to lessen thermal effects.

ULTRA QV404 PRO

SPECIFICATIONS

Model No.		**ULTRA QV404 PRO**
Range	X-axis	16″ / 400mm
	Y-axis	16″ / 400mm
	Z-axis	8″ / 200mm
Resolution		0.01µm
High-sensitivity CCD camera		B&W
Accuracy* (20°C±0.2°C)	E_{1XY}	(0.25+L/1000)µm
	E_{1Z}	(1.5+2L/1000)µm [(1+2L/1000)µm: 10 - 60mm]
	E_{2XY}	(0.5+2L/1000)µm
Max. drive speed (X/Y/Z-axis)		150mm/sec
Illumination (PRL: Programmable Ring Light)	Surface	Halogen
	Contour	Halogen
	PRL	Halogen
Magnification change system		Programmable power turret
Stage glass size		19.4 x 21.7″ / 493 x 551mm
Max. stage loading		88lbs / 40kg
Dimensions (W x D x H)**		47.2 x 68.3 x 75.2″ /1200 x 1735 x 1910mm
Mass**		4746lbs / 2150kg

* The measuring accuracy is defined at the following conditions
Programmable power turret: 1X, Objective set: 5X
L = Dimension between two arbitrary points (mm)
** Including machine stand

Mitutoyo

QV ACCEL

SERIES 363 — CNC Vision Measuring System

FEATURES

Moving-bridge type structure

Designed with primary focus on measurement efficiency, the machine adopts a more rigid construction and drives the X and Y axes at 400mm/s (QV ACCEL808, ACCEL1010), which is approximately 30% faster than that of standard QV Apex models. The moving-bridge type structure also eliminates the need for a moving stage. This facilitates a more simplified design of the workpiece fixture, resulting in a significant reduction in the man-hours required for fixture fabrication and inspection.

QV ACCEL808PRO

QV ACCEL1212PRO

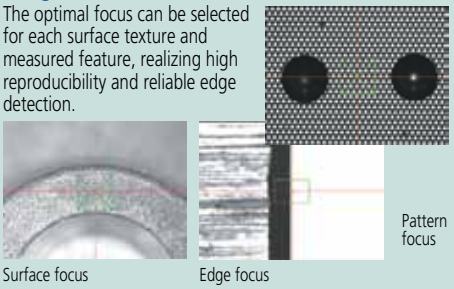
SPECIFICATIONS

Model No.		QV ACCEL808PRO QV ACCEL808PRO3	QV ACCEL1010PRO QV ACCEL1010PRO3	QV ACCEL1212PRO QV ACCEL1212PRO3	QV ACCEL1517PRO QV ACCEL1517PRO3
Range	X-axis	32″ / 800mm	40″ / 1000mm	50″ / 1250mm	60″ / 1500mm
	Y-axis	32″ / 800mm	40″ / 1000mm	50″ / 1250mm	70″ / 1750mm
	Z-axis	6″ / 150mm	6″ / 150mm	4″ / 100mm	4″ / 100mm
Resolution		0.1µm			
High-sensitivity CCD camera		B&W (PRO3 model: color)			
Accuracy*	E_{1XY}	(1.5+3L/1000)µm		(2.2+3L/1000)µm	
	E_{1Z}	(1.5+4L/1000)µm		(2.5+5L/1000)µm	
	E_{2XY}	(2.5+4L/1000)µm		(3.5+4L/1000)µm	
Max. drive speed	X/Y-axis	400mm/s		300mm/s	
	Z-axis	150mm/s		150mm/s	
Illumination (PRL: Programmable Ring Light)	Surface	LED, RGB (PRO3 models: Halogen)			
	Contour	LED, white (PRO3 models: Halogen)			
	PRL	LED, RGB (PRO3 models: Halogen)			
Magnification change system		Programmable power turret			
Stage glass size		34.8″ x 37.7″ 883 x 958mm	46.7″ x 46.7″ 1186 x 1186mm	56.7″ x 56.7″ 1440 x 1440mm	67.5″ x 77.5″ 1714 x 1968mm
Dimensions (W x D x H)		58 x 67.5 x 62″ 1475x1716x1578mm	75.3 x 82 x 63″ 1912x2086x1603mm	85.3 x 92 x 61″ 2166x2340 x1554mm	96 x 113 x 61″ 2440 x 2868 x 1554mm
Max stage loading		22lbs / 10kg	22lbs / 10kg	66.1lbs / 30kg	66.1lbs / 30kg
Mass		5666lbs / 2570kg	6504lbs / 2950kg	7937lbs / 3600kg	9921lbs / 4500kg

* The measuring accuracy is defined at the following conditions, Programmable power turret: 1X, Objective set: 2.5X, L = Dimension between two arbitrary points (mm)

Image Multi-AutoFocus

The optimal focus can be selected for each surface texture and measured feature, realizing high reproducibility and reliable edge detection.

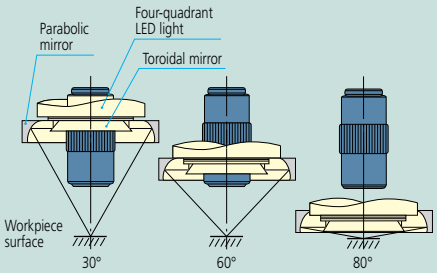


Surface focus

Edge focus

Programmable Ring Light (PRL)

Fine control of obliquity and direction provides illumination optimal for measurement. Obliquity can be arbitrarily set in the range from 30° to 80°. This type of illumination is effective for enhancing the edge of inclined surfaces or very small steps. Illumination can be controlled independently in every direction, back and forth, right and left. Measurement with edge enhancement is possible by forming a shadow by lighting from only one direction.



RGB Color LED Illumination

Changing the illumination color to red, green, blue, or white (synthesized) allows detection of edges which could not be measured with conventional white light.

Laser Auto Focus (LAF) Function*

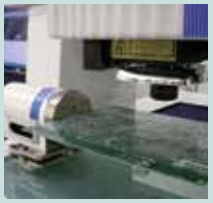
Mitutoyo offers models featuring the LAF system which enables high-speed focusing.

*Available to PRO 3 model.

Optional Index table*

Automatic multi-plane measurement is possible with the optional index table.

*Not available with QV ACCEL models



Accessories for Quick Vision

Objective †

Objective	Order No.	Working distance
QV-SL0.5X	**02AKT199**	30.5mm
QV-HR1X	**02AKT250**	40.6mm
QV-SL1X	**02ALA150**	52.5mm
QV-HR2.5X	**02AKT300**	40.6mm
QV-SL2.5X	**02ALA170**	60mm
QV-5X	**02ALA420**	33.5mm
QV-10X	**02ALG010**	30.5mm
QV-25X	**02ALG020**	13mm

The monitor magnification and field of view values are for the PRO machine.
QV-10X, QV-25X: Depending on a workpiece of illumination may be insufficient at a turret lens magnification of 2X and 6X.
QV-25X: The PRL illumination is restricted in its usable position.

Objective mag.	Turret lens mag.	Monitor mag.	View Field
0.5X	1X	16X	12.54 x 9.40
	2X	32X	6.27 x 4.70
	6X (4X)	96X (64X)	2.09 x 1.56 (3.13 x 2.35)
1X	1X	32X	6.27 x 4.70
	2X	64X	3.13 x 2.35
	6X (4X)	192X (128X)	1.04 x 0.78 (1.56 x 1.17)
2.5X	1X	80X	2.50 x 1.88
	2X	160X	1.25 x 0.94
	6X (4X)	480X (320X)	0.41 x 0.31 (0.62 x 0.47)
5X	1X	160X	1.25 x 0.94
	2X	320X	0.62 x 0.47
	6X (4X)	960X (640X)	0.20 x 0.15 (0.31 x 0.23)
10X	1X	320X	0.62 x 0.47
	2X	640X	0.31 x 0.23
	6X (4X)	1920X (1280X)	0.10 x 0.07 (0.15 x 0.11)
25X	1X	800X	0.25 x 0.18
	2X	1600X	0.12 x 0.09
	6X (4X)	4800X (3200X)	0.04 x 0.03 (0.06 x 0.04)

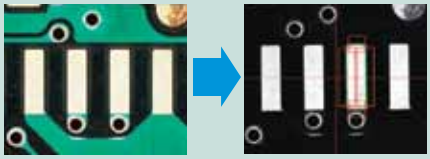
QV-Index Head*

Automatic multi-plane measurement is possible with the optional index table.

Max. workpiece diameter	5.51" / 140mm
Max. workpiece mass	4.41 lbs / 2kg
Min. rotation angle	0.1°
Positioning accuracy	±0.5°
Max. rotation speed	10rpm

RGB color filtering unit*

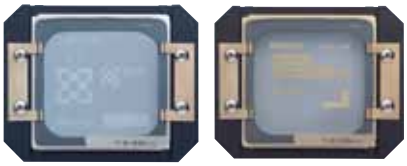
The color filtering function can be added to the vertical reflected illumination or programmable ring light in Quick Vision models that use a halogen light source. This function enhances the visibility of low-reflection surfaces on colored workpieces, facilitating edge detection. This function can also be retrofitted to a conventional Quick Vision. In addition, a yellow filter enables vision measurement in the yellow light region, which provides high sensitivity.



Red filter used

Calibration glass chart No. 02AKN020 †

A calibration chart is used to compensate for the pixel size of the CCD chip, autofocus accuracy and the optical axis offset at each magnification of the variable magnification unit (PPT).

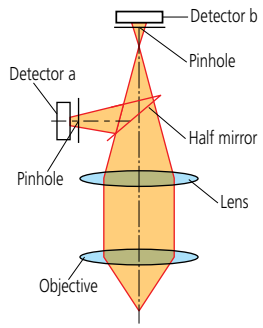


Laser Auto Focus* (Factory-installed option)

The system can be equipped with a Laser Auto Focus unit that allows a stable, high-speed height measurement during high-speed travel. This unit provides stable measurement results with minimum dependence on surface inclination since the double pinhole method is adopted in the detection system.

Objective	QV2.5X
Measurement principle	Double pinhole method
Laser spot diameter	3μm
Repeatability	σ = 0.4μm

Example: Height of leads from a QFP package



Safety Precautions against Laser Beam

This system uses a low-power visible laser beam which corresponds to a CLASS 1 (visible light) of IEC 60825 for measurement. The CLASS 1 laser warning label as shown right is attached to the main unit.

CLASS 1 LASER PRODUCT

* Accessories for Quick Vision Series only
† Accessories for Quick Vision and Quick Scope Series

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Quick Scope

SERIES 359 — CNC / Manual Vision Measuring System

QS200Z

SPECIFICATIONS

Model No.		QS200	QS250	QS200Z	QS250Z
Range	X-axis	8" / 200mm	8" / 200mm	8" / 200mm	8" / 200mm
	Y-axis	8" / 200mm	10" / 250mm	8" / 200mm	10" / 250mm
	Z-axis	4" / 100mm	4" / 100mm	4" / 100mm	4" / 100mm
Resolution		0.5µm			
Scale type		Linear encoder			
Measuring accuracy (at 20°C)*		XY: (2.5+6L/1000)µm, Z: (5+6L/1000)µm			
Magnification	Objective	2.5X, 1X, 5X	2.5X, 1X, 5X	0.5X - 3.5X zoom	0.5X - 3.5X zoom
	On monitor	105X (at 2.5X)	105X (at 2.5X)	21X - 147X	21X - 147X
Image detecting unit		Color CCD camera			
Illumination		Surface: co-axial light, fiber-optic ring light Contour: stage light			
Stage glass size		10.6 x 10.3" 269 x 261mm	10.6 x 12.2" 269 x 311mm	10.6 x 10.3" 269 x 261mm	10.6 x 12.2" 269 x 311mm
Max. workpiece height		4.3" / 110mm	4.3" / 110mm	4.3" / 110mm	4.3" / 110mm
Max. stage loading		22lbs / 10kg	22lbs / 10kg	22lbs / 10kg	22lbs / 10kg
Dimensions (W x D x H), Mass		18.3 x 32 x 26" / 465 x 815 x 663mm, 167lbs / 76kg			

*When using 2.5X objective or the zoom lens in 2.5X magnification (Magnification on monitor: 105X), L = Measuring length (mm)

FEATURES: CNC model

- Surface, contour and fiber-optic ring light illumination options enables users to configure the QS lighting to meet a variety of measurement needs.
- Powerful, Windows® based QSPAK software is easy to use and offers a wide spectrum of measuring and analysis capabilities.
- Functions include zoom, auto-focus, measurement playback, one-click edge detection, graphic display, 48 different macros and a pattern matching function for several common part features.
- The stage can be controlled by mouse or through the optional multi-function control box.

QS-L2010/AFB

SPECIFICATIONS

Model No.		QS-L2010/AFB	QS-L2010Z/AFB	QS-L2010ZB	QS-E2010B
Range (X-axis / Y-axis / Z-axis)		8" x 4" x 6" / 200 x 100 x 150mm			
Resolution		0.1µm			
Scale type		Linear encoder			
Measuring accuracy (at 20°C)*		XY: (2.5+20L/1000)µm Z: (5+6L/1000)µm		XY: (2.5+20L/1000)µm Z: (5+40L/1000)µm	XY: (3+20L/1000)µm Z: (5+40L/1000)µm
Magnification	Objective	2.5X, 1X, 5X	0.5X - 3.5X zoom	0.5X - 3.5X zoom	2.5X, 1X, 5X
	On monitor	105X (at 2.5X)	21X - 147X	21X - 147X	105X (at 2.5X)
Image detecting unit		Color CCD camera		Color CMOS camera	
Illumination		Surface: co-axial light, fiber-optic ring light Contour: stage light			
Stage glass size		10 x 6" / 250 x 150mm			
Max. workpiece height		6" / 150mm			
Max. stage loading		22lbs / 10kg			
Dimensions (W x D x H), Mass		25 x 28 x 28" / 624 x 705 x 722mm		25 x 30 x 28" / 624 x 769 x 722mm	
Mass		146lbs / 66kg		159lbs / 72kg	146lbs / 66kg

*When using 2.5X objective or the zoom lens in 2.5X magnification (Magnification on monitor: 105X), L = Measuring length (mm)

FEATURES: Manual model

- Excellent surface observation model for a wide variety of workpieces.
- 0.1µm resolution and 150mm Z-axis range.
- Power zoom enables easy and fast magnification change.
  (QS-L2010/AFB is a fixed-magnification type)
- Fine illumination capability enables lighting changes to match workpiece requirements.
- The quick release system on the stage enables instant switching between coarse movement and fine movement.
- Quick Navigation function enables the user to repeat measurements quickly.
- An auto-focus function is available for QS-L2010/AFB and QS-L2010Z/AFB.

Quick Image

SERIES 361 — Non-contact 2-D Vision Measuring System

Quick Image is a new concept in 2-D vision measuring instruments. It provides unique features for improving measurement efficiency.

FEATURES

- Long focal depth and wide field of view
- Telecentric optical system
- Mega-pixel color CCD camera
- Large quadrant LED ring light

QI-A2010B

QI-B4020B

SPECIFICATIONS

Model		QI-A505B	QI-B505B	QI-A1010B	QI-B1010B	QI-A2010B	QI-B2010B	QI-A2017B	QI-B2017B	QI-A3017B	QI-B3017B	QI-A4020B	QI-B4020B
Range	X, Y-axis	2 x 2" / 50 x 50mm		4 x 4" / 100x100mm		8 x 4" / 200x100mm		8 x 7" / 200 x 170mm		12 x 7" / 300 x 170mm		16 x 8" / 400 x 200mm	
	Z-axis	1" / 25mm		4" / 100mm		4" / 100mm		4" / 100mm		4" / 100mm		4" / 100mm	
Measuring mode		High-resolution mode and Normal mode											
Accuracy	Within the screen	QI-A models: ±5µm (high-resolution mode), ±8µm (normal mode) [QI-B models: ±2.7µm (high-resolution mode), ±4µm (normal mode)]											
	U_{1XY}	±(5+0.08L)µm L = measuring length (mm)											
Repeatability within the screen (±2σ)		QI-A models: ±1µm (high-resolution mode), ±2µm (normal mode) [QI-B models: ±0.7µm (high-resolution mode), ±1µm (normal mode)]											
CCD camera		Megapixels color CCD camera											
Optical system	Magnification*	0.2X	0.5X	0.2X	0.5X	0.2X	0.5X	0.2X	0.5X	0.2X	0.5X	0.2X	0.5X
	Working distance	90mm											
	Depth of focus	High-resolution mode: ±0.6mm, Normal mode: ±11mm (±1.8mm) ( ): QI-B models											
Illumination	Contour	✓		✓		✓		✓		✓		✓	
	Surface	✓		✓		✓		✓		✓		✓	
	4-quadrant LED	✓		✓		✓		✓		✓		✓	
Stage glass size		3.4x3.2" / 86x82mm		6.7x6.7" / 170x170mm		9.5x5.5" / 242x140mm		10.2x9" / 260x230mm		14x9" / 360x230mm		17.3x9" / 440x232mm	
Max. stage loading		11lbs / 5kg		22lbs / 10kg		22lbs / 10kg		44lbs / 20kg		44lbs / 20kg		33lbs / 15kg	
Mass		44lbs / 20kg		154lbs / 70kg		163lbs / 74kg		309lbs / 140kg		326lbs / 148kg		340lbs / 154kg	

*Double telecentric system

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